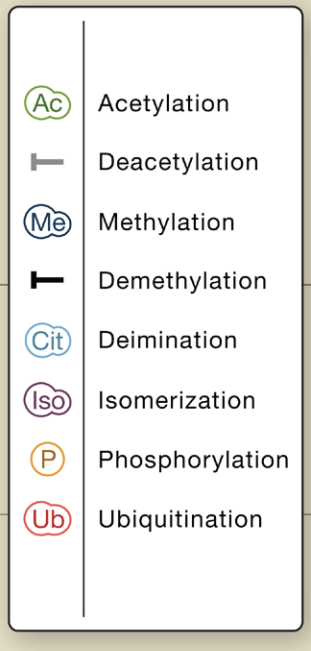
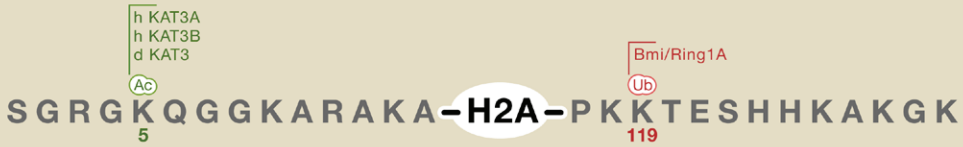
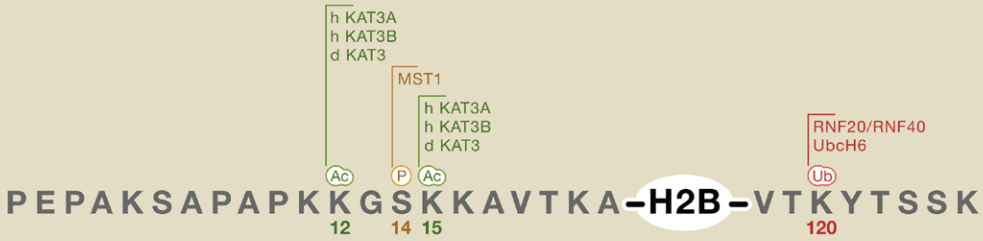
SnapShot: Histone-Modifying Enzymes

Tony Kouzarides
The Gurdon Institute, University of Cambridge, Cambridge CB2 1QN, UK







See online version for legend and references.

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The nucleosome is the fundamental unit of chromatin. It is composed of an octamer of the four core histones (H3, H4, H2A, H2B) around which 147 base pairs of DNA are wrapped. Several distinct classes of enzyme can modify histones at multiple sites. This SnapShot depicts those histone-modifying enzymes whose specificity has been determined along with the residues that they modify. The names given to three groups of enzymes (acetyltransferases, lysine methyltrasferases, and lysine demethylases) follow the new nomenclature for these enzymes, which is defined in a Correspondence on page 633 of this issue. This SnapShot is a revised version of one first published in the February 23, 2007 issue of *Cell*. Figure adapted from Margueron et al. (2005).

REFERENCES

Jenuwein, T., and Allis, C.D. (2001). Translating the histone code. Science *293*, 1074–1080.

Kouzarides, T. (2007). Chromatin modifications and their function. Cell *128*, 693–705.

Margueron, R., Trojer, P., and Reinberg, D. (2005). The key to development: Interpreting the histone code? Curr. Opin. Genet. Dev. *15*, 163–176.

Martin, C., and Zhang, Y. (2005). The diverse functions of histone lysine methylation. Nat. Rev. Mol. Cell Biol. *6*, 838–849.

Nowak, S.J., and Corces, V.G. (2004). Phosphorylation of histone H3: A balancing act between chromosome condensation and transcriptional activation. Trends Genet. *20*, 214–220.

Shaw, P.E. (2007). Peptidyl-prolyl cis/trans isomerases and transcription: Is there a twist in the tail? EMBO Rep. *8*, 40–45.

Shi, Y., and Whetstein, J.R. (2007). Dynamic regulation of histone lysine methylation by demethylases. Mol. Cell *25*, 1–14.

Shilatifard, A. (2006). Chromatin modifications by methylation and ubiquitination: Implications in the regulation of gene expression. Annu. Rev. Biochem. *75*, 243–269.

Sterner, D.E., and Berger, S.L. (2000). Acetylation of histones and transcription-related factors. Microbiol. Mol. Biol. Rev. *64*, 435–459.

Thomson, P.R., and Fast, W. (2006). Histone citrullination by prorein arginine deiminase: Is arginine methylation a green light or a roadblock? ACS Chem. Biol. *1*, 433–441.

Zhang, Y., and Reinberg, D. (2001). Transcription regulation by histone methylation: interplay between different covalent modifications of the core histone tails. Genes Dev. *15*, 2343–2360.

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